

HAWTHORNE NAVAL AMMUNITION DEPOT, REDWOOD COOLING TOWER  
(Hawthorne Naval Ammunition Depot, Bldg. No. 169)  
U.S. Highway 95  
Hawthorne  
Mineral County  
Nevada

HAER No. NV-5-A

HAER  
NEV  
11-HAWT,  
4A-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
Department of the Interior  
Western Region  
San Francisco, California 94107

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HAWTHORNE NAVAL AMMUNITION DEPOT, REDWOOD COOLING TOWER  
(Hawthorne Naval Ammunition Depot, Building No. 169),

HAER No. NV-5-A

**Location:** West of Industrial Area  
Hawthorne Army Ammunition Plant,  
Hawthorne,  
Mineral County,  
Nevada

**Date(s) of Construction:** 1943

**Engineer/Builder:** The Fluor Corporation/ U. S. Navy

**Present Owner:** U. S. Army  
Hawthorne Army Ammunition Plant  
P. O. Box 2448  
Hawthorne, NV 89415

**Present Use:** not used

**Significance:** The Hawthorne Naval Ammunition Depot (NAD) is a nationally significant military district. It was built for state-of-the-art ammunition storage in the late 1920s and is by and far the largest depot of its kind known in the world with 2501 magazines and storehouses, 212 miles of railroad track, 418 miles of blacktop, and 232 square miles of land. It is significant for its role in World War II. Producing a vast amount of ordnance, it was THE Naval Ammunition Depot for the Pacific Theater during World War II. The Cooling Tower was built in 1943 during the tremendous expansion of the Depot during the World War II period.

**Report Prepared by:** Ana B. Koval,  
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**Date:** September 1, 1993

### Significance:

The Cooling Tower, Building No. 00169, was built in 1943 during the tremendous expansion of the Depot during the World War II period. It was constructed to the west of the Industrial Area during an upgrade of the water system.

The Hawthorne Naval Ammunition Depot (NAD) is a nationally significant military district. It was built for state-of-the-art ammunition storage in the late 1920s and is by and far the largest depot of its kind known in the world with 2501 magazines and storehouses, 212 miles of railroad track, 418 miles of blacktop, and 232 square miles of land. It is significant for its role in World War II. Producing a vast amount of ordnance, it was THE Naval Ammunition Depot for the Pacific Theater during World War II.

Operations have included: production of propellant charges, projectiles, bombs and rockets; demilitarization of all types of munitions; and storage of national stock piles of munitions. Since the 1940s until the facility was turned over to the Army in 1977, Hawthorne NAD was the country's largest producer of Navy mines and depth charges.

The Hawthorne NAD is also significant for the role it played in the military history of the State of Nevada. It is the oldest twentieth century U. S. military reservation in Nevada representing 50 plus years of federal military operation. It has been in continuous active operational status since its commissioning in 1930. The Depot contains the best collection of early twentieth century military, cultural resources in Nevada. It also represents the largest industrial activity in the State of Nevada during World War II, as well as during the Korean and Vietnam conflicts. The Depot significantly changed the fortunes of the town of Hawthorne becoming the local area's major employer and bringing relative economic stability to the town of Hawthorne since its commissioning.

Over 90% of the buildings within the 148,000 plus acres of the Hawthorne NAD date from World War II or before. The district as a whole and great majority of the individual buildings within it retain integrity of design, setting, materials, workmanship, feeling, and association.

### Description:

The Cooling Tower, Building No. 00169 was used to cool well water from 1943 until 1989. Two of the several wells required that the water being pumped out of the ground be cooled. The hot water was pumped through the cooling tower and then the cooled water was stored in a 250,000 gallon underground storage tank. The tower is 12 feet by 30 feet by 39 feet tall and sits on a poured concrete foundation of stem walls, footers, and a slab. The tower itself was constructed of 4" by 4" posts which support panels of redwood slats. The tower is one bay wide by three bays long with each structural bay containing a complete X brace. The water is pumped

to the top of the tower and is run over the redwood panels directing the water back and forth through five levels, creating a manmade waterfall and cooling the water. The water is stored underground until it is piped into the water system. A ladder on the north side of the tower and a catwalk was used to maintain the tower. The tower is in deteriorating condition with a crumbling concrete foundation and missing and broken redwood elements.

The tower was constructed in 1943 at a cost of \$7,500. and cooled water for 45 years using only energy to pump the water into the tower. This design appears to have been one of several cooling towers designed by The Fluor Corporation in 1943. The drawings which accompany this report appear to be similar to the cooling tower constructed but not exactly the same. (See page 7-12.)

### History:

The Hawthorne NAD was created by an Act of Congress following the destruction of the Navy's East Coast main ammunition facility in 1926. In 1928, \$3.5 million were allotted for the development of the Naval Ammunition Depot at Hawthorne. Starting in 1935, plans were laid to increase the size of the depot. In 1939 the expansion began in earnest and the depot began producing ammunition and shipping it to classified locations. With the bombing of Pearl Harbor on December 7, 1941, Hawthorne NAD took on new importance; the Hawthorne depot was the principal west coast naval ammunition plant. Over 2,000 construction workers increased the size of the depot tenfold during World War II and 5,500 workers produced a tremendous amount of ammunition. Bombs, mines, and rockets were filled and assembled at Hawthorne NAD. Mines and rockets were also being developed and tested here.

The Hawthorne Depot continued to play an important role in the Navy's chain of producing, storing, and destroying munitions after World War II. After W.W.II the depot was responsible for the destruction of thousands of tons of munitions. During the Korean and Vietnam conflicts the Hawthorne NAD provided back-up storage of conventional ammunition and mines for the entire Pacific theater. In 1977, under directive of the Department of Defense, Hawthorne Naval Ammunition Depot was transferred to the Army and became the Hawthorne Army Ammunition Plant.

### History of Water Supply:<sup>1</sup>

Below is a history of the Hawthorne Depot's water system through 1952.

The original water supply for this Depot was obtained entirely from surface run-off in Cat and Rose Creeks. The supply system consisted of one 5" collection line from

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<sup>1</sup>Indenco Engineers, Inc. "Water Supply Study for the Naval Ammunition Depot, Hawthorne, Nevada". n.d. (circa 1953) Section 2, pp. 1-4.

Cat Creek and one 4" collection line from Rose Creek, both of which fed into a single 8" line that carried the water from a valve box located at the site of the present distribution reservoir to a point in the industrial area. In 1930, this system was augmented by construction of a two compartment earth covered concrete distribution reservoir. This reservoir having a capacity of 466,000 gallons and an elevation of overflow of 4336 feet above Mean Sea Level, is still in service as a distribution reservoir for the Station.

In 1932, additional storage for the system was provided by construction of a concrete arch dam in Cat Creek above the distribution reservoir. Total storage in the Cat Creek Reservoir is 50 million gallons; it is an on-stream reservoir, and its spillway elevation is 5003 feet above Mean Sea Level.

In 1935, still another storage reservoir was built. This reservoir, having a capacity of 35 million gallons, and a spillway elevation of 6310 feet above mean sea level, is located on an off-stream shelf in Rose Creek Canyon. When put into operation, this reservoir developed extensive leakage through sides and bottom, and an unsuccessful attempt was made to seal it with Bentonite Clay. Subsequently, this clay was removed and replaced with a Gunitite lining, which has apparently been effective in sealing the reservoir.

Also in 1935, a diversion structure was built in Squaw Creek Canyon, and a 3" pipe line run to a tie-in with the original 4" Rose Creek line, adding an additional source to the Station's supply.

In 1940, the 5" line from Cat Creek reservoir to the Distribution Reservoir was paralleled with another 5" line, and this new line was continued from the distribution reservoir out to the 110 Area.

In 1941, an additional 8" pipe line was run from Rose Creek Reservoir to the Distribution Reservoir paralleling the original 4" line; and a 10" high pressure line was run in from Cat Creek Dam to an elevated tank in the Ordinance Area (Tank No. 5).

The 10" high pressure line together with Tank No. 5 transformed Cat Creek Reservoir from a storage reservoir to a combination storage and distribution reservoir. This line and the completion of Well No. 1 in 1942 established a distribution system that was in actually three separate systems as follows:

1. Surface water distributed from one-half of the Station reservoir for domestic and industrial use in the industrial area.
2. Well water distributed from the other half of the station reservoir for irrigation and fire protection in the industrial area.
3. Surface water distributed from Cat Creek and Tank No. 5, for all uses in the North Magazine Area.

From 1942 to 1944, the system built around the 10" high pressure line was expanded by the addition of Tank No. 6 for fire protection in the smokeless powder and projectile magazine areas, and by addition of a pressure reducing station and a 10" pressure line to supply Tank No. 7 in the Low Cost Housing Area (Babbitt). Also during this period 5 additional wells were drilled and 6 additional elevated tanks installed to augment the irrigation supply and to furnish water to the Pamlico Area, which is relatively far removed from the other areas served.

In 1947, the Bureau of Reclamation prepared a preliminary report on the domestic water supply for the Station and recommended that the Navy construct a 50 million gallon storage reservoir, and also purchase all water rights on Dutch and Cottonwood Creeks to supplement the existing supply of surface water. Acting upon this recommendation, the Navy did purchase the water rights in Cottonwood Creek, and in 1950 built a diversion structure and laid 9.8 miles of 10 and 12 inch pipe line from Cottonwood Creek to the Station distribution reservoir.

Subsequently, a problem arose in connection with this installation: in the fall and winter of 1951, no water reached the diversion structure although there was water in the stream bed above; and upon investigation, it was discovered that during the low flows, the stream was going underground before reaching the diversion. To remedy this situation, a temporary diversion structure was constructed approximately 1000 feet upstream from the initial diversion, and an 8" pipe line laid connecting the two. This installation did not eliminate the underground losses in the basin immediately behind the initial diversion structure, and in the winter of 1951 this basin was lined with Gunite, which has apparently accomplished the desired purpose.

With regard to the recommended 50 million gallon storage reservoir, construction was begun in 1951 and completed in the spring of 1952. However, before the initial filling of this reservoir could be completed, the foundation material failed, apparently due to consolidation under seepage, and to the date of this report, this reservoir has never been filled to capacity. Repair work is under way at this writing (circa 1953), and it is believed that this reservoir will be in service in the near future.

The recommendation regarding purchase of water rights on Dutch Creek has not been acted upon by the Navy to date, but in 1952 a Parshall Flume was installed at the probable diversion site on the creek to measure flows.

In 1951, construction was started on an entirely separate irrigation system to supply well water to alfalfa stands and windbreaks in the Babbitt area. This system was completed under a second contract in 1952.

Also in 1952, another connection to the 10" high pressure line from Cat Creek was made to augment the Babbitt supply. This connection consisted of 4000' of 8" steel pipe, and pressure reducing valve pit and connection to the existing 10" low pressure line from Babbitt to the Naval Barracks area.

In addition to all of the foregoing, a new source of water for the Station was tapped in 1952 by installing a diversion structure on House Creek with a 4 inch pipeline tied into the original 4" Rose Creek line.

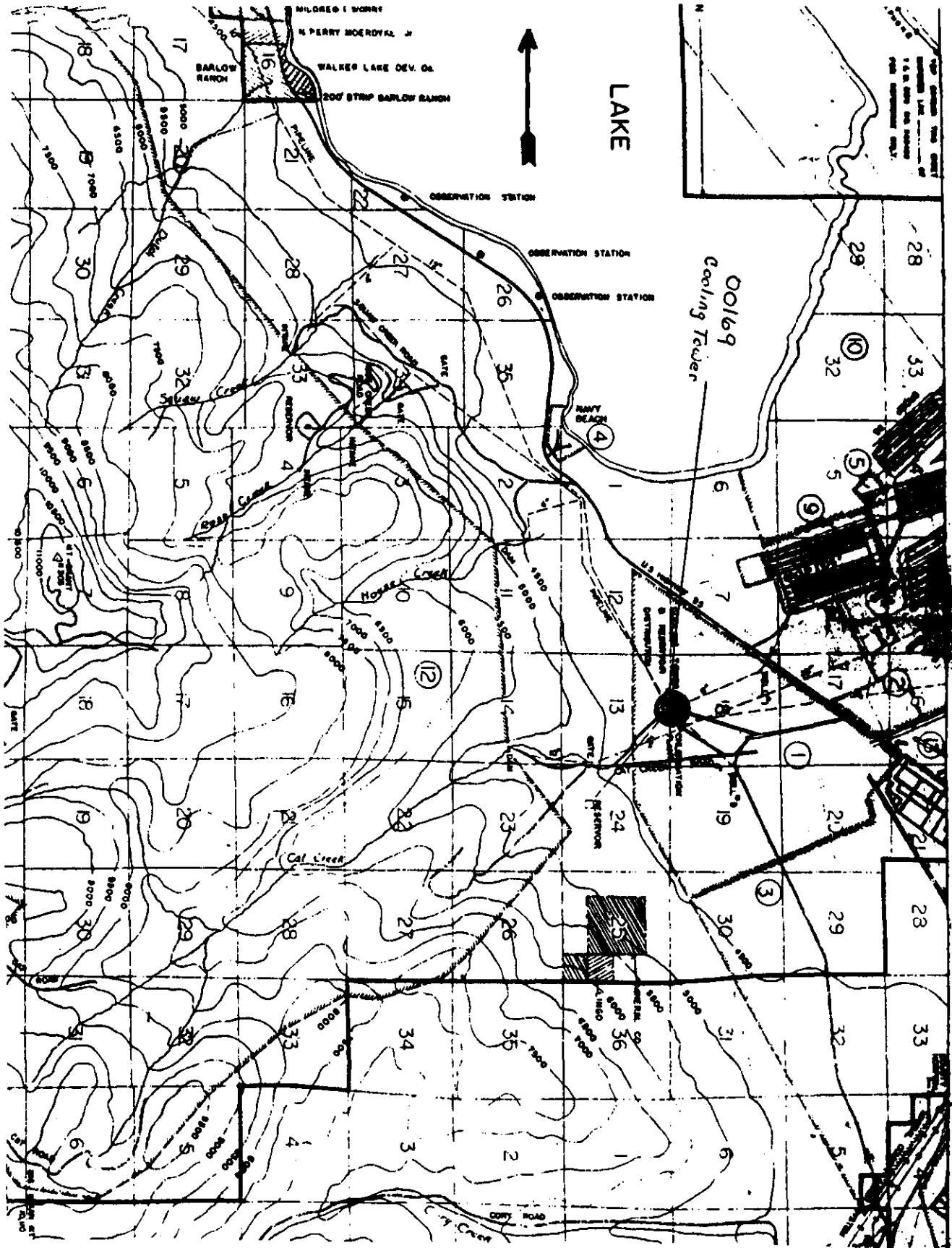
Sources:

Hawthorne Army Ammunition Plant Real Property Records.

Indenco Engineers, Inc. "Water Supply Study for the Naval Ammunition Depot, Hawthorne, Nevada". n. d. (circa 1953)

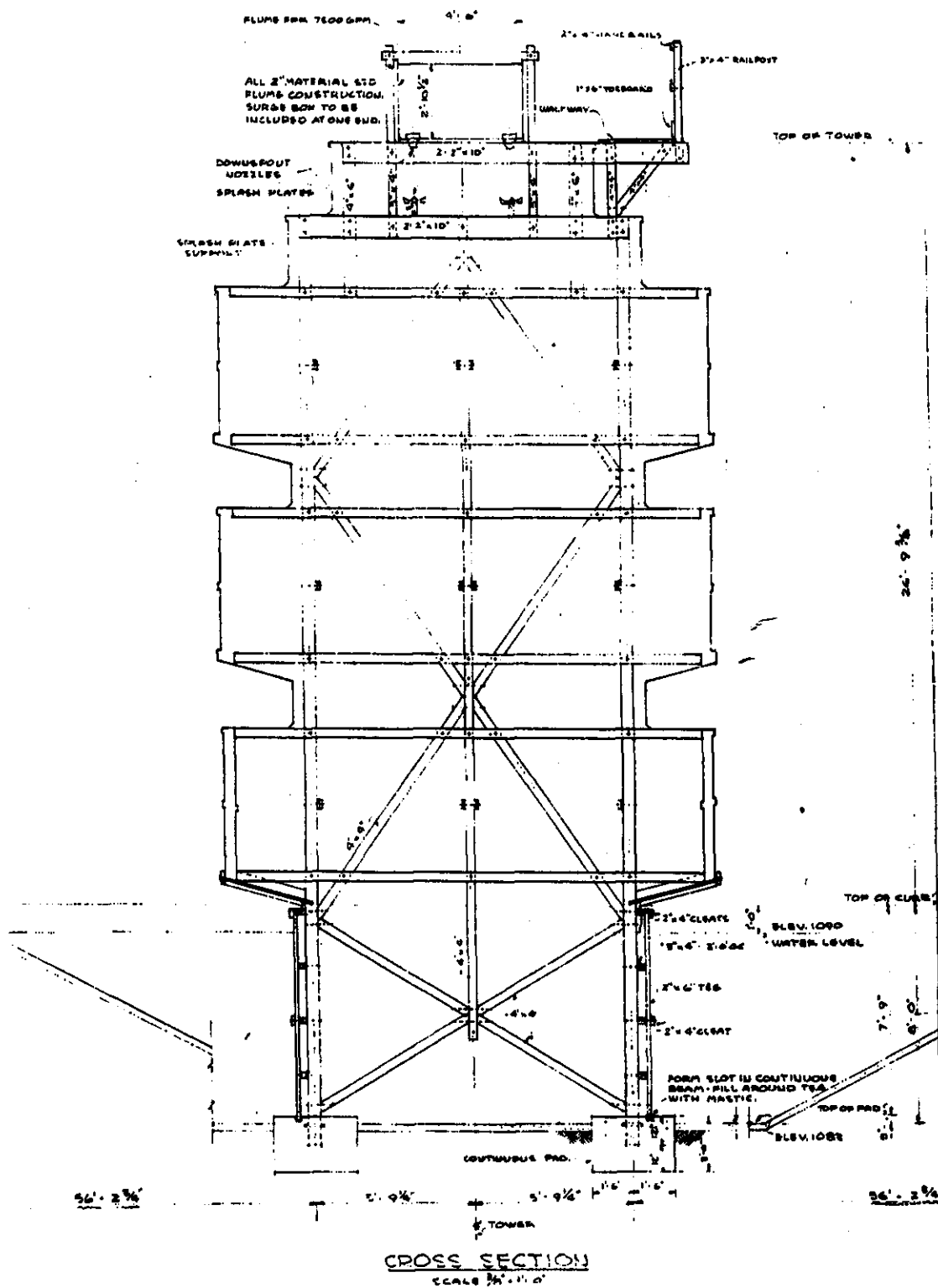
Koval, Ana B. "Hawthorne Naval Ammunition Depot" National Register of Historic Places District nomination. 1989.

MacDonald, Roy D. Interview on March 10, 1993.





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REFERENCE DRAWINGS			

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NOTE: FRAMING OF THIS TOWER IS IDENTICAL WITH OTHER AREA TOWERS

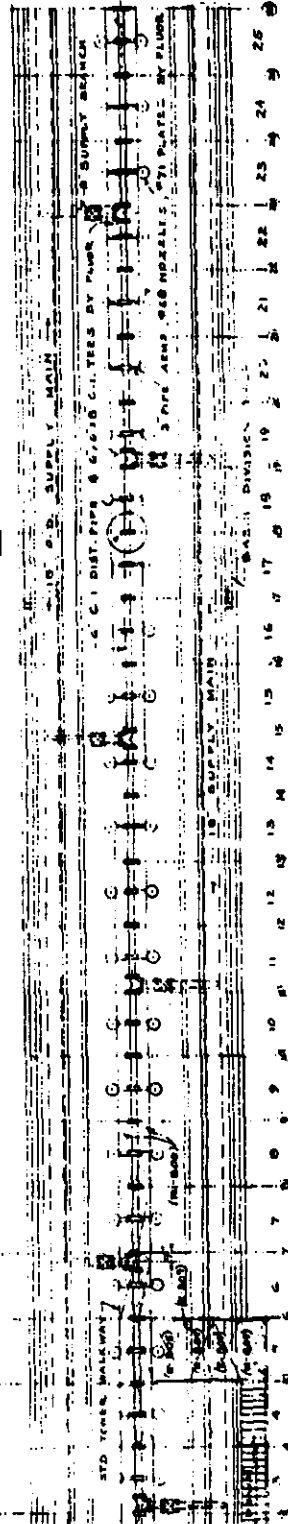
CERTIFIED  
 FOR CONSTRUCTION

JAN 5 1951

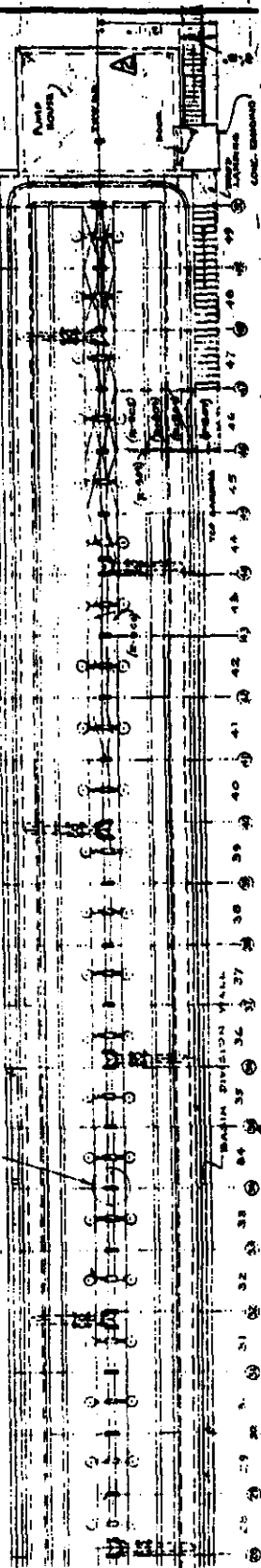
49 BAYS @ 6'-0" = 294'-0" (C-C BUILDINGS) JUNE PLUMB COMP. L.S.  
 BY *N.Y. Engineering*

1/8" BLIND PLATE IN THIS JOINT —

71



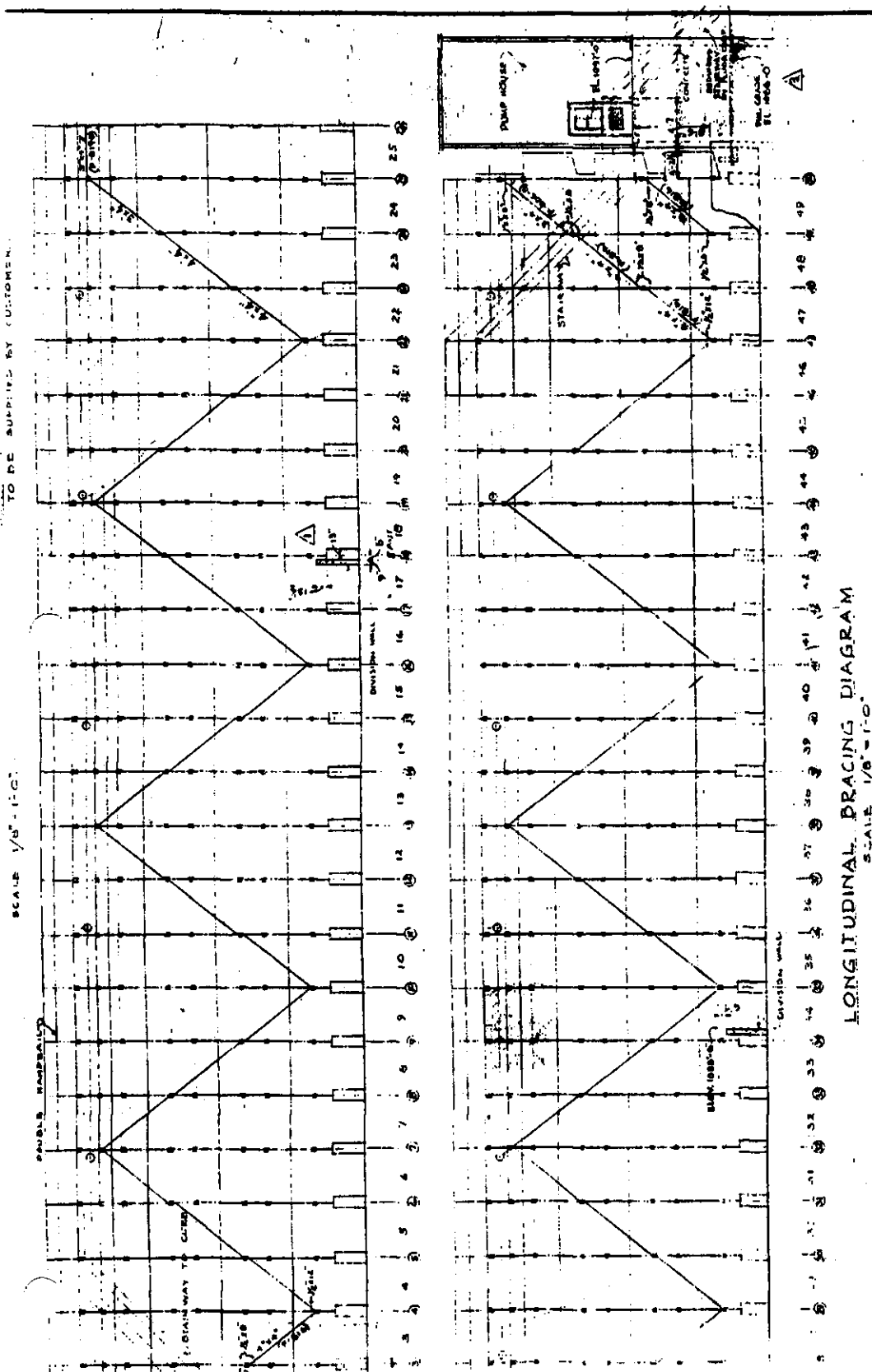
1/8" BLIND PLATE IN THIS JOINT



PLAN OF DISTRIBUTING SYSTEM

HAWTHORNE NAVAL AMMUNITION DEPOT, Redwood Cooling Tower  
(Hawthorne Naval Ammunition Depot, Building. No. 169)  
HAER No. NV-5-A  
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### LONGITUDINAL BRACING DIAGRAM

SS-A1-E 1/8" - 1'-0"

DATE	REVISIONS	BY	APP.
4/3	CHANGED STAIRWELL ACCESS FROM PORCH TO SIDE WALL IN LOCATION OF CONCRETE WALL IN BASELINE 10' REMOVED IN PERMANENT DITCH SYSTEM	ED	3/24
4/3	NOTE 1) AS BUILT		
4/3	CHANGED STAIR DIMENSIONS		
4/3	REMOVED STAIR DIMENSIONS		

**NOTES:**

1. SEE SHEET 100 FOR PLAN DIMENSIONS AND SEE THIS SHEET FOR ELEVATION DIMENSIONS.

2. SEE PLANS FOR DIMENSIONS AND ELEVATIONS.

3. SEE ELEVATIONS FOR DIMENSIONS AND ELEVATIONS.

4. SEE ELEVATIONS FOR DIMENSIONS AND ELEVATIONS.

5. SEE ELEVATIONS FOR DIMENSIONS AND ELEVATIONS.

6. SEE ELEVATIONS FOR DIMENSIONS AND ELEVATIONS.

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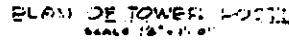
10. SEE ELEVATIONS FOR DIMENSIONS AND ELEVATIONS.

**THE FLUOR CORPORATION LTD.**  
**CONSTRUCTORS AND ENGINEERS**  
 1000 North Main Street, Los Angeles, California 90012  
 Telephone: (213) 621-1000

**CROSS SECTION PLAN AND LONGITUDINAL BRACING DIAGRAM FOR MODEL 49-A-3 FLUOR ALERATOR COOLING TOWER 15-1: THE KAISER COMPANY, TONTONA, CALIF.**

DATE: 3-3-19  
 DRAWN BY: J. H. B. 3-3-19  
 CHECKED BY: J. H. B. 3-3-19  
 APPROVED BY: J. H. B. 3-3-19

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By A. J. Jennings

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